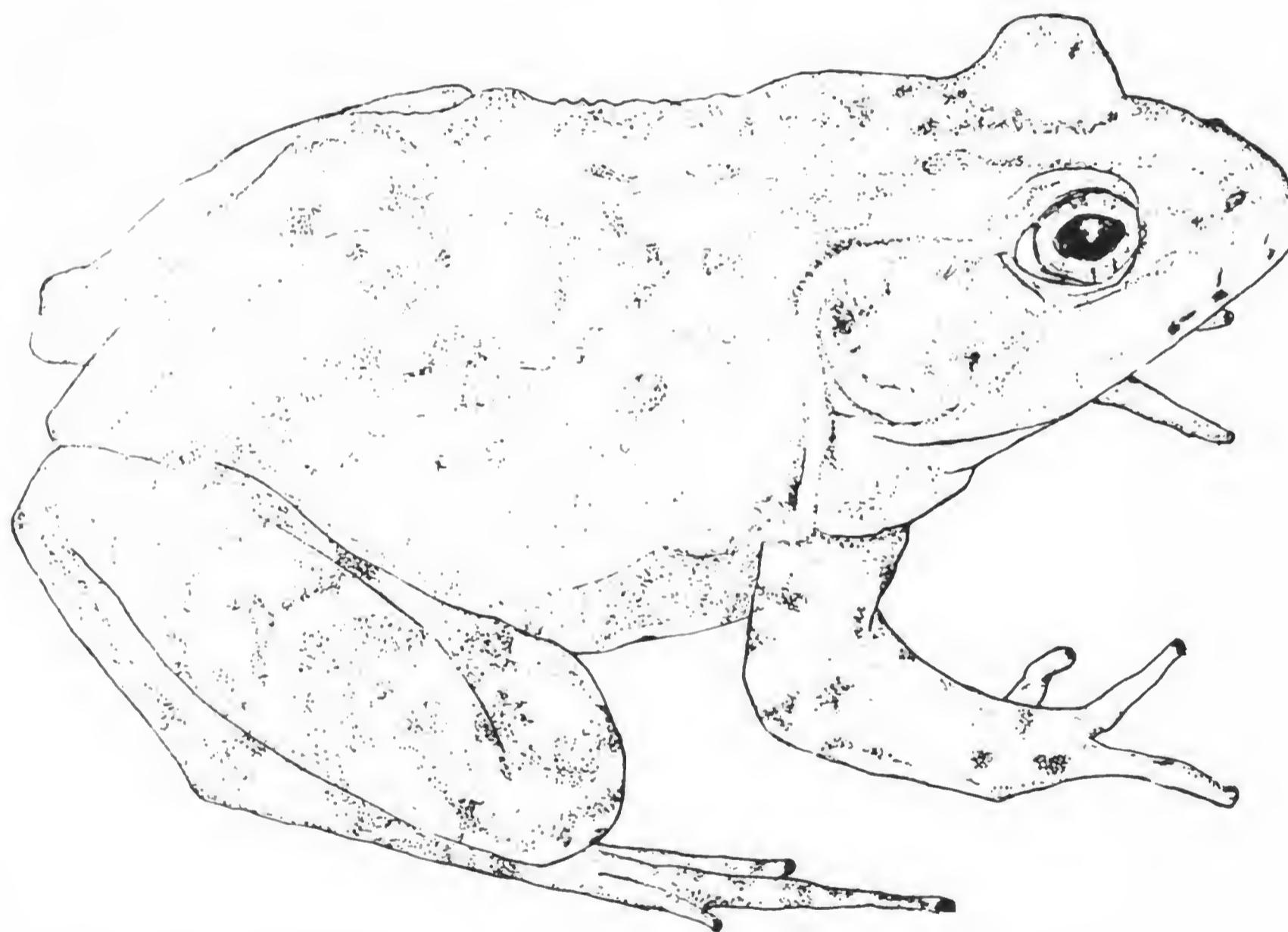


# CATESBEIANA



BULLETIN OF THE VIRGINIA HERPETOLOGICAL SOCIETY

VOLUME 3

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BULLETIN INFORMATION

Catesbeiana, the Bulletin of the Virginia Herpetological Society, is issued twice a year by the Virginia Herpetological Society. Membership is open to all individuals interested in the study of amphibians and reptiles. Dues are \$5.00 per volume year for adults, \$3.00 for individuals under the age of 18, and \$7.50 for families. Membership includes one subscription to Catesbeiana. Dues are payable to: Ben Greishaw, VaHS Treasurer, 7622 Hollins Road, Richmond, VA 23229. Make checks payable to the Virginia Herpetological Society. Herpetological societies desiring exchange of publications should send copies of their publications to: Dr. Joseph C. Mitchell, Dept. of Biology, University of Richmond, Richmond, VA 23173. Any materials for publication should also be sent to Dr. Mitchell.

MEETING NOTICE

The fall meeting of the VaHS will be held at Longwood College, Farmville, VA on 1 October 1983. See page 14 for details.

DUES NOTICE

Membership dues for 1984 (Catesbeiana vol. 4, nos. 1 and 2) are due by 1 January 1984.

Cover: Rana catesbeiana by Christopher A. Pague

## EDITORIAL POLICY

Catesbeiana replaced the formal name of the Bulletin of the Virginia Herpetological Society in 1981 as the publication of the VaHS to reflect the changes in the society's structure. Although the format of the bulletin changed dramatically, its adherence to the central theme of the science of Virginia herpetology has remained firm. Beginning with the editorship of F. J. Tobey (1958-1980) and continuing with D. A. Merkle (1981-1982), the bulletin has published with few exceptions, only scientific information and news on the herps of Virginia. We will maintain that tradition. During several meetings in 1980 and 1981, brief discussions addressed this point. It was agreed that Catesbeiana will publish articles pertaining to herpetology outside of Virginia only if insufficient material is on hand to complete an average size issue (about 18 pages). In this vein, articles pertaining to species found in Virginia will take precedence over those which do not. Rarely, if ever, will articles be reprinted in Catesbeiana after they have been published elsewhere. If someone is unsure whether something he/she has is appropriate, he or she should contact the editor.

Authors may wish to submit articles in final copy-ready form. To maintain consistency, the type is IBM Letter Gothic (with 12 characters per inch), using a carbon ribbon; all margins are 1 inch, leaving the pages unnumbered. Consult the style of articles in this issue for additional information. Please be advised, however, that articles are usually reviewed by at least one officer (past or present) of the VaHS in addition to the editor. All changes must be approved by the author before publication. Thus, manuscripts, in final copy or not, should be submitted well in advance of March or September.

Reprints of articles are not available to authors; however, authors may reprint articles themselves to meet professional needs.

Herpetological artwork is welcomed. If the artwork has been published elsewhere, we will need to obtain copyright before we can use it in an issue. We need drawings and encourage members to send us anything appropriate, especially their own work.

REPTILE AND AMPHIBIAN RECORDS FROM THE VIRGINIA PIEDMONT -- 1975 TO 1981

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The following species records were obtained during both amateur and professional field work between 1975 and 1981. Records from the professional work were made during February, March and November, 1976 in Amherst, Appomattox and Nelson Counties and during 1978 in eastern Albemarle, northern Fluvanna, Louisa, Goochland, Dinwiddie, Lunenburg, Mecklenburg and northern Brunswick Counties. During the professional work I was employed by the Urban Wildlife Research Center, Columbia, Maryland investigating the effects of highways on wildlife (Adams and Geis, 1978, 1981). Professional records are identified by "FHWA" in brackets following the initial description.

Records from the non-professional work were obtained as adjuncts to personal studies in other disciplines or as fortune provided them. A concentrated study of the herptiles of the dioritic Green Springs igneous intrusion in west-central Louisa County is reported in Bazuin (1983); these records are not repeated here.

The intent of this paper is to document herptile distributional observations made available to the Virginia Herpetological Society and to provide information on herptile distributions and annual cycles that may prove useful in obtaining a full understanding of the herpetofauna of the Virginia Piedmont. All specimens mentioned below have been conveyed to the VaHS, as have duplicates of at least one photograph (35 mm slide) for each individual indicated as having been photographed.

Species reports follow the order presented in Conant (1975).

Terrapene carolina carolina (Eastern Box Turtle). On 15 March 1978 I found the earliest individual I have ever encountered just south of I-64 near Mechunk Creek (about one mile east of Rt. 616) just west of the Albemarle/Fluvanna county boundary in Albemarle County (FHWA). It was very sluggish. The weather had been quite cold in early March but warm rain and daily highs in the 50's (F) between 11 and 15 March were probably responsible for bringing the animal out of hibernation. On 12 April 1978 I found one apparently just emerging from hibernation about 0.1 mile south of Rt. 613 and about 0.75 mile west of Big Lickinghole Creek in central Goochland County (FHWA). The turtle was at the edge of a hole shaped like itself and had not freed itself from the leaf litter when first discovered. The hole would have been covered by about 0.75 inches of soil plus the leaf litter while the turtle was hibernating and was in a Virginia pine forest near a patch of oaks. On 13 June 1978 I observed an encounter between an apparently amorous male and an apparently unreceptive female in the I-64 right-of-way 0.8 miles west of its intersection with Rt. 522 in extreme south-central Louisa County (FHWA). When first noted the female was lying on her side with the shell nearly closed and the male was facing her a short distance away from her plastron side. Shortly thereafter the male charged the female and rolled her over one and a quarter times, which left her on her back. He then began biting the edge of her carapace at both the head and tail ends and clawing the edge of her carapace at the head end. The female opened the front of her plastron when the male was occupied elsewhere but closed it when he approached her head. Following this activity the male moved away; the actions of the female was not thereafter noted.

Chrysemys picta picta (Eastern Painted Turtle). On 17 September 1979 I took a photograph of a live individual on the surface of Rt. 601 about 1.5 miles west of its intersection with Rt. 622 in southeastern Spotsylvania County.

Sceloporus undulatus hyacinthinus (Northern Fence Lizard). A very sluggish adult female probably newly emerged from hibernation was found about 100 meters north of Rt. 617 about 0.9 mile west of its intersection with Rt. 15 in west-central Louisa County on 22 March 1978 by Sarah Thomas (FHWA). Several photographs were taken of it by Raleigh Emery. On 26 May 1978 I collected a young female found on a dead tree trunk extending over a large stream about 0.1 mile east of Rt. 676 about 1.0 mile north of its intersection with Rt. 621 in extreme eastern Goochland County (FHWA).

Storeria o. occipitomaculata (Northern Redbelly Snake). On 29 March 1978 I found an adult about 18 cm. long under a small log in an open hardwood forest about 0.1 mile north of Rt. 688 about 0.5 mile east of its intersection with Rt. 208 near Bell's Crossroads in south-central Louisa County (FHWA). Several photographs were taken of it by Raleigh Emery.

Heterodon platyrhinos (Eastern Hognose Snake). On 6 December 1978 I found a very dark (nearly black) individual still active during a warm spell about 0.2 mile east of I-85, about 0.8 mile north of its intersection with Rt. 650 in central Dinwiddie County, in a patch of regenerating Loblolly Pines and mixed deciduous trees about 15 feet tall in the midst of a varied Loblolly Pine and deciduous forest (FHWA). This snake put on its feigned-death act with a little encouragement. On 15 September 1979 I photographed a yellow-and-dark checkered individual on Rt. 622, about 0.5 mile north of its intersection with Rt. 652 in northeastern Louisa County.

Carpophis a. amoenus (Eastern Worm Snake). On 24 April 1978 I found an individual about 30 cm. long under a log in a brushy, open-canopied forest about 0.1 mile east of I-85, about 0.5 mile north of its intersection with Rt. 650 near DeWitt in central Dinwiddie County (FHWA). On 26 May 1978 I found two together under a log in a brushy deciduous forest in a stream valley about 0.1 mile east of Rt. 676, about 0.1 mile north of its intersection with Rt. 621 in eastern Goochland County (FHWA). One of the latter was preserved.

Coluber c. constrictor (Northern Black Racer). This species seemed particularly common from central Dinwiddie to northern Brunswick Counties during the spring of 1978. I found five in this area between 24 April and 10 May (FHWA). This is considerably more than ten times the rate at which I usually find them on the Virginia Piedmont.

Opheodrys aestivus (Rough Green Snake). Raleigh Emery and I found an individual about 60 cm. long draped over a shrub with its head in a hole in the floor of a Virginia Pine/deciduous forest about 0.2 mile north of I-64, about 0.6 mile west of its intersection with Rt. 622 in northeastern Goochland County on 21 May 1978 (FHWA). Photographs were taken of this snake by Raleigh Emery.

Elaphe o. obsoleta (Black Rat Snake). On 1 September 1976 I was shown five reptile eggs that had been found by a workman two days before in a pile of mulch beside a small stable 0.1 mile east of Rt. 602, about 1.8 miles north of its intersection with Rts. 7 and 193 at Dranesville in northwestern Fairfax County. Examination of one of the eggs demonstrated that it contained a fairly well developed young Black Rat Snake about 18 to 20 cm. long. Time did not permit examination and further processing of the remaining eggs and they were eventually discarded.

Agkistrodon contortrix mokeson (Northern Copperhead). A rare snake on the Virginia Piedmont in my experience; I have probably not seen over a half dozen here in 15 years of field work. On 16 September 1978 I found two together in a sunny spot on the floor of a deciduous forest in a stream valley just north of I-64, about 0.7 mile west of its intersection with Rt. 629 in extreme north-central Goochland County (FHWA). They had disappeared by the time I returned with a camera.

Ambystoma opacum (Marbled Salamander). An individual about nine centimeters long was found in direct proximity with a Spotted Salamander (Ambystoma maculatum) about 18 cm. long by Sarah Thomas in a decaying log in a wet stream valley under deciduous trees about 0.1 mile north of I-64, about 0.75 mile west of its intersection with Rt. 629 on 6 April 1978 (FHWA). Several photographs were taken of it by Raleigh Emery.

Ambystoma maculatum (Spotted Salamander). See the Marbled Salamander discussion for one record. Photographs were also taken of this individual by Raleigh Emery. On a day in early to mid July, 1979, a large Spotted Salamander crawled out of a hole in the wall of an archeological test pit in a deciduous forest near the Potomac River and Sugarland Run in extreme northeastern Loudoun County and fell to the bottom of the pit! I examined and photographed it before it was released.

Plethodon c. cinereus (Redback Salamander). On 7 October 1975 I found hundreds of these salamanders in and under bales of waste hay in a fallow field about one mile south of Rt. 22 at its intersection with Rt. 636 at Will's Chapel in west-central Louisa County. At least 96% were of the red-backed phase. Between 18 and at least 24 November 1976 I found four in a mixed pine/deciduous forest near Rt. 654 in north-central Appomattox County (FHWA). They were active (two were caught in pit traps) during this rather mild period in spite of a preceding month-long spell of near-record cold. On 6 April 1978 I found numerous Redback Salamanders under logs on the floor of a varied Virginia Pine/deciduous woods along Rt. 646, about 0.75 mile north of its intersection with Rt. 603 in extreme northwestern Goochland County (FHWA). Most were of the red-backed phase and had rather bright red backs but one was intermediate between the red-backed and lead-backed phases in having a reddish-brown rear dorsum ending about mid-dorsum, with the front of the dorsum being a gray-brown color continuous with the color of the sides.

Eurycea bislineata (Two-lined Salamander). On 6 April 1978 I found four individuals of this species in a rocky stream in a deciduous forest about 0.15 mile west of Rt. 646, about 0.75 mile north of its intersection with Rt. 603 in extreme northwestern Goochland County (FHWA) and one was preserved. The specimen preserved was of particular interest in having a row of bubble-like marks on each side that is supposedly (Conant, 1975, p. 289) typical of the southern subspecies (E. b. cirrigera), though this location should be at least 40 miles north of the northern end of the range of this subspecies (Conant, 1975, Range Map 240). On 26 May 1978 I found and collected two individuals of this species in a large, rocky stream in an open, mature deciduous forest about 0.1 mile east of Rt. 676, about one mile north of its intersection with Rt. 621 in extreme eastern Goochland County (FHWA). One of these had a broken line of bubble-like marks on each side.

Bufo americanus (American Toad). February and early March of 1976 were exceptionally warm and started anurans calling early. The first American Toads heard calling were two near Rt. 654 about three miles from its intersection with Rt. 24 in northern Appomattox County on 2 March (FHWA).

Hyla crucifer (Spring Peeper). During the remarkably warm February of 1976 the first Spring Peepers were heard calling along Rt. 29 in extreme southern Nelson County on 18 February (FHWA). These are the earliest I have ever heard calling on the Virginia Piedmont. By 25 February they were in full chorus in northern Appomattox County (FHWA). Late calling records occurred in 1978 in Dinwiddie and northern Brunswick Counties, where a few were heard daily in late November and early December. The last one was heard on 9 December just south of the Nottoway River adjacent to Rt. 1 in extreme north-central Brunswick County just before the passage of a major cold front (FHWA).

Hyla versicolor (Gray Treefrog). Following the remarkably warm February of 1976 the first Gray Treefrog of the season was heard adjacent to Rt. 608 in north-central Appomattox County on the extraordinarily early date of 1 March (FHWA).

Pseudacris triseriata feriarum (Upland Chorus Frog). This species usually begins calling in the spring about a day or two later than the first Spring Peepers. During the remarkably warm February of 1976 the first individual of the season was heard calling on 19 February along Rt. 29 near the Tye River in extreme north-central Amherst County (FHWA). By 25 February they were in full chorus in northern Appomattox County (FHWA). This species does not seem so prone to call in the fall as does the Spring Peeper. However, one was heard calling just west of I-85 about 0.75 mile south of its intersection with Rt. 709 in south-central Dinwiddie County on 3 December 1978 during a warm spell (FHWA) and one each day was heard on 24 and 25 November 1979 near Cub Run in extreme west-central Fairfax County and near the Potomac River in Algonkian Regional Park in extreme northeastern Loudoun County, respectively, during another warm spell.

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## TAGGING LARVAL SALAMANDERS

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Populations studies of larval salamanders have been hampered by inadequate tagging techniques (Turner, 1960). Several methods have been used to mark larval salamanders. However, none of the previously described methods, used by themselves or in combination with each other, allow monitoring of larvae from hatching through transformation. Whole body staining (Herried and Kinney, 1966; Guttman and Creasy, 1973) and tail clipping (Turner, 1960) produce temporary tags but appear to be detrimental to the larvae (Cecil and Just, 1978). Fluorescent pigments (Ireland, 1973; Taylor and Deegan, 1982) will mark salamander larvae but these tags will not last through the entire larval period. Acrylic polymers have been successfully used to mark large larval frogs (Cecil and Just, 1978) and salamanders (Ireland, unpublished ms), but this method cannot be used on small larvae. This paper describes two new tagging techniques that, when used in combination with each other, mark salamander larvae from hatching through transformation.

Fluorescent pigments (Phiney, Miller, and Dahlberg, 1967; Ireland, 1973) suspended in a solution of 25% mineral oil, 10% dimethyl sulfoxide (DMSO), 1% NaOH, 64% water, were sprayed at 45 lbs psi air pressure, directly on the larvae. Larvae were collected with dip nets and sprayed in the nets. Air pressure was supplied by a portable two horsepower gasoline-powered air compressor. A commercial paint spray gun was used to apply the pigments. The resulting mark could be observed on all surfaces exposed to the spray when the larvae were placed in a black box illuminated with a long wave ultraviolet lamp.

Larger larvae (15 mm TL) were marked with a thin paste of congo red stain and DMSO. A patch of skin, ca.  $1 \text{ mm}^2$ , was removed from the ventral surface immediately anterior to the vent. The underlying muscle tissue was teased with a sharp probe and the paste was applied to the lesion. The wound was then sealed with a cyanocrylate adhesive (Duro - Super Glue). The adhesive dried quickly, bonding to the soft tissue and forming a seal over the lesion. In 10 - 15 days the stain was incorporated into the muscle tissue resulting in a red mark.

Recently hatched Ambystoma maculatum and Eurycea longicauda larvae were collected, tagged with fluorescent pigments, and maintained in the laboratory. The resulting marks were discernable in all larvae for at least 45 days and had no apparent detrimental effects on the larvae (Table 1). Forty-five days after marking with fluorescent pigments, all surviving larvae were remarked with congo red-DMSO. Initially this tag appeared as a red spot and as the lesion healed, the tag became a diffuse red area superficially resembling a highly vascularized area of skin, but distinctly different when viewed through a 10X hand held lens. No scar tissue was visible around the mark and larval growth was not affected (Table 1). These techniques successfully tagged all larvae from hatching through transformation and did not affect survivorship of larvae maintained in the laboratory (Table 1).

Field testing of these techniques was conducted in two breeding ponds, one used by Ambystoma maculatum and the other used by Eurycea longicauda. Two hundred recently hatched A. maculatum larvae and 100 recently hatched E. longicauda

Table 1. Retention of fluorescent pigment and congo red-DMSO tags by larval salamanders maintained in the laboratory. Recently hatched larvae were marked with fluorescent and remarked after 45 days with congo red-DMSO. All surviving larvae and transforming individuals, indicated by parentheses, retained visible marks.

	Number of Surviving Larvae										
	Days After Marking										
	0	10	20	30	45	60	75	90	105	120	150
	Fluorescent Pigments						Congo Red - DMSO				
♂	<u>Ambystoma maculatum</u>	50	48	48	46	44	44	40	39	38	30(3) 23(16)
	<u>Eurycea longicauda</u>	50	46	40	40	38	37	34	33	29	25 21(2)
	<u>A. maculatum*</u>	50	40	40	47	44	43	41	40	40	32(2) 20(12)
	<u>E. longicauda*</u>	50	45	43	40	37	34	32	32	30	27 23(1)

\*Untagged larvae maintained in separate aquaria

Table 2. Retention of fluorescent pigment and congo red-DMSO tags in two larval salamander populations. Numerator = number of recaptured previously marked larvae, denominator = total number captured. Percent of marked individuals is in parentheses.

			Days After Tagging							
			10	20	30	40	60	90	120	150
<u>Number Tagged</u>			Fluorescent Pigments				Congo Red - DMSO			
<u>Ambystoma</u> <u>maculatum</u>	200	19 March 1980	$\frac{72}{184}(39)$	$\frac{64}{201}(32)$	$\frac{60}{193}(31)$	$\frac{51}{170}(30)$	$\frac{43}{110}(39)$	$\frac{27}{84}(32)$	$\frac{20}{72}(27)$	$\frac{14}{61}(23)^*$
<u>Eurycea</u> <u>longicauda</u>	100	6 May 1981	$\frac{22}{60}(36)$	$\frac{18}{42}(43)$	$\frac{19}{43}(44)$	$\frac{13}{37}(35)$	$\frac{15}{39}(38)$	$\frac{12}{30}(40)$	$\frac{9}{31}(29)$	$\frac{7}{24}(29)**$

\* - included 21 transforming individuals

\*\* - included 3 transforming individuals

larvae were tagged with fluorescent pigments and released back into the breeding ponds. Forty days after marking the larvae with fluorescent pigments, 51 previously tagged A. maculatum and 13 E. longicauda larvae were recaptured and retagged with congo red-DMSO marks (Table 2). Samples were collected from the populations at 10-30 day intervals and the proportion of marked to unmarked larvae in the samples did not apparently differ throughout the larval period, indicating that the tags were retained and did not affect survivorship (Table 2). By using these two techniques it is possible to mark larval salamanders from hatching through transformation. No other currently available marking methods will successfully tag larvae throughout the larval period. These techniques will permit calculation of accurate population size estimates throughout the larval period and the determination of larval survivorship.

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## THE VIRGINIA NATURAL DIVERSITY INFORMATION PROGRAM

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In January 1981, the Virginia Chapter of The Nature Conservancy embarked on a program to identify the areas of greatest ecological significance in Virginia based on the occurrences of rare plants, animals, and natural communities. By identifying these areas we could then concentrate our protection efforts on the rarest elements of natural diversity. Using methodologies developed in other State Natural Heritage Programs and the Science Department of the Conservancy's National Office, we began assessing the condition of Virginia's natural diversity. Starting with a data base assembled during an earlier attempt to establish a Heritage Program in Virginia in 1978 and the information presented in the Proceedings of the Symposium on Endangered and Threatened Plants and Animals of Virginia published in 1979, we began defining lists of species and communities which were imperiled and need special attention. These lists were continually refined and updated based on new information gathered from recent scientific literature, museum and university collections, and knowledgeable individuals across the country. As our information increased, it became clearer which species and communities are the rarest and in the greatest jeopardy of possible destruction. This focused our field work in these high priority areas where we gathered site specific information on the plants, animals and natural communities, plus information on land ownership and management needs. We are now in the midst of preserve selection and design where all of the material gathered to date on an area is assembled and a strategy is planned for the protection of that area.

To date, approximately 470 special plants and 350 special animals have been identified across the state. Of this number, approximately ten percent are considered the rarest elements and are known from only one or, at the most, a few locations. Over 75 areas have been identified as potential preserves, and 30 of these are having detailed preserve design packages prepared.

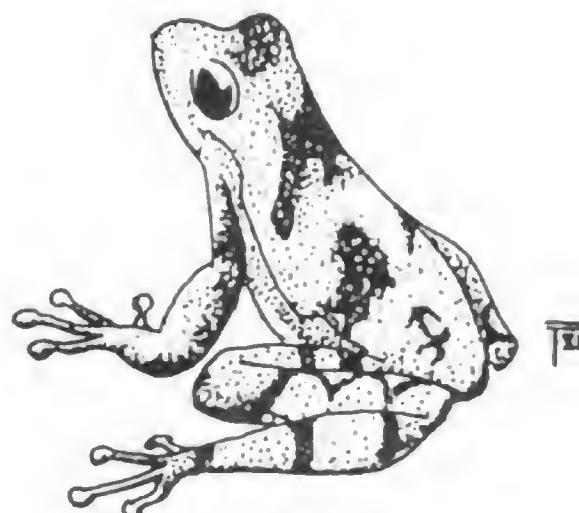
Most areas not only have rare plants and/or animals, but are also unusual natural communities. Areas such as shale barrens, sinkhole ponds, pine barrens, brackish marshes, calcareous wet meadows, mountain bogs or fens, granite flat-rocks, northern hardwood-spruce forests, and cave systems usually have five to six and perhaps a dozen special plants and/or animals. It is these areas with large concentrations of special elements that tend to rank the highest and are receiving our immediate attention for protection. Some of the areas identified are publicly owned, such as lands in the National Park Service, U.S. Forest Service, National Wildlife Refuges, U.S. Military Reservations, state forests and state parks. By informing these agencies that unique species or communities exist on their lands, special arrangements can be made to ensure their protection. However, most of the areas presently identified are in private ownership, and it is on these lands that we face our greatest challenge in ensuring their protection, whether it be by outright purchase of the land or any one of a number of protection strategies. Still other areas may be beyond the scope of protection that the Conservancy normally tries to give. These would include certain marine and aquatic habitats where we cannot ensure their protection except by urging the

state or federal agencies involved to maintain the necessary water quality and quantity for the survival of the species in question.

The work has actually just begun. During the past two and a half years, many plants and animals thought to be quite rare have turned out to be more common than first thought; it's just a matter of looking in the right places once the preferred habitat has been identified. However, in other cases, certain plants and animals are apparently gone from where they once occurred in abundance, usually due to habitat destruction. Still others thought to be extirpated from the state, or even extinct, have been rediscovered and several plants not previously known to occur in Virginia were found during the course of our field work. Some of these are separated from the other known populations by as much as 300 to 400 miles.

Each field season adds considerable information to our knowledge of Virginia's natural diversity. Future work will concentrate on identifying the best remaining examples of our many plant communities, further work on our aquatic communities and strategies for protecting them and continued refinements and additions to the species and areas we have identified so far. Clearly, if we hope to make conservation priorities now and in the future, a comprehensive and up-to-date ecological data base is an invaluable asset.

Presently our Special Animal list includes 38 amphibians and 38 reptiles. Our work is concentrating on some of the rarer species such as the green salamander, hellbender and bog turtle. Information from the Virginia Herpetological Society has been extremely helpful in determining status and distribution, plus prioritizing species. As more work is done on Virginia's herps, we hope to work closely with the VaHS and lend our assistance where needed.



## FIELD NOTES

This section provides a means of publishing natural history information on Virginia's amphibians and reptiles which does not lend itself to full-length articles. Observations on geographic distribution, ecology, reproduction, phenology, behavior and other areas are welcomed. Reports can be on a single species, groups of species or fauna from selected areas, such as a state park or county. The format for these reports is TITLE (species or area), COUNTY and LOCATION, DATE OF OBSERVATION, OBSERVERS, DATA AND OBSERVATIONS. Names and addresses of authors should appear one line below the report. Consult published notes or the editor of this section if your information does not fit this format.

If the note includes information on geographic distribution, a voucher specimen or color slide should be taken for verification and deposited in a recognized museum or sent to this editor. Species identification for observational records should be verified by a second person.

Send records (double spaced, typed) or inquiries to Dr. Joseph C. Mitchell, Dept. of Biology, University of Richmond, Richmond, VA 23173.

The correct citation is: Pague, C. A. and B. J. Larson. 1982. Field notes: Oconeechee State Park. *Catesbeiana*, Bull. Virginia Herpetol. Soc. 2(2):12.

\* \* \* \* \*

Elaphe obsoleta obsoleta (Black Rat Snake): Charlotte Co., Virginia, South Isle Plantation, 24 July 1983, Robert N. Bader.

On 24 July 1983 a large oak tree, approximately 14 meters tall and 45 centimeters in diameter, fell during a brief wind storm. The tree was mostly hollow and the stump was full of rotten sawdust.

During examination of the tree several snake eggs were noticed at the base of the tree. Digging in the sawdust revealed large numbers of hatched eggs as well as 15 recently laid eggs. The hatched eggs were in various stages of decay, indicating several years of successive layings. There were also numerous pieces of egg shell mixed in with the sawdust.

A total of 102 whole hatched eggs were found, as well as the 15 newly laid eggs, now under incubation. The eggs are all Elaphe obsoleta obsoleta.

The fallen tree was located in the back yard of an occupied house. There have not been any sightings of snakes in the yard for the last several years. I would, thus, rule out a large communal nesting site, but instead suggest this observation indicates a single snake laying eggs in the same place for many successive years.

Robert N. Bader, Route 2 Box 78, Brookneal, VA 24528.

## ANNOUNCEMENTS

Fall VaHS Meeting - The fall meeting of the VaHS will be held on 1 October 1983 at Longwood College, in Farmville, VA. Dr. Don Merkle will host the meeting and, as he has done in the past, will provide excellent facilities and a relaxing atmosphere for us.

The business meeting is at 10AM and, after a lunch break from about 12 to 1 PM, the general meeting and paper session will be held until about 5PM.

Place: Stevens-McCorkle Science Building, Longwood College

Information: Dr. D. A. Merkle, Department of Natural Sciences, Longwood College, Farmville, VA 23901 (804-392-9353)

ESHL Meeting - The 1984 meeting of the Eastern Seaboard Herpetological League will be sponsored by the VaHS and will be held on 17 March 1984 in Williamsburg, VA. Dr. Jack Brooks will coordinate the arrangements at the College of William and Mary and Bob Bader will organize the program. This meeting is an all day affair and will include a slate of invited speakers. Tentative talks include behavior and ecology of Anolis lividus, snake feeding adaptations, reptile diseases, and population ecology of freshwater turtles.

Organization of this meeting will take up much of the time in the business meeting on October 1, so if you would like to help out, please attend our fall meeting. We hope to mail the ESLH meeting program and abstracts to our membership in early 1984.

## NEWS AND NOTES

Spring 1983 VaHS meeting - The April 23, 1983 meeting of the VaHS was hosted by Dr. R. L. Hoffman at Radford University. About 30 members and nonmembers were in attendance. After an early business meeting, papers were presented by six members:

Reproduction and larval survivorship in a population of Ambystoma maculatum, by Dr. Patrick Ireland

Salamanders of Mount Rogers, by Dr. Gene Gourley

Lower Wilson Creek, Caldwell County, North Carolina: a thermal refugeum for reptiles, by Paul Nicoletto

Activity budget of Sceloporus undulatus, by Dr. Jack Brooks and Mary Ross

Food partitioning among three species of lizards from Sonora, Mexico, by Dr. Jack Brooks and Dr. Joe Mitchell

Sexual selection in Bufo terrestris, by Chris Pague

Most of the group got together during lunch, but only a few went on the salamander field trip in the afternoon because of the cool and wet weather. Those who went enjoyed collecting Plethodon yonahlossee, Desmognathus quadramaculatus, among others.

## NEWS AND NOTES (CONTINUED)

Chris Pague leaves Norfolk Zoo - Chris Pague, an active VaHS member and graduate of VPI and SU, recently decided to take the plunge and return to graduate school for his Ph.D. He was the curator of herps and small mammals at the zoo. He will be working under the guidance of Dr. Alan Savitzky in the Ecological Sciences Program at Old Dominion University. His new address is: Division of Biological Sciences, Old Dominion University, Norkfolk, VA 23508.

We should note here as well that Dr. Savitzky joined ODU last year and has already participated in VaHS activities. He is primarily interested in snake feeding adaptations and functional morphology. He teaches courses in comparative vertebrate morphology, vertebrate natural history and herpetology.

Virginia Non-Game Species Program Funds Herpetology Research - The Non-Game Species Program of the Virginia Commission of Game and Inland Fisheries recently (July, 1983) awarded a 5-year grant to Dr. Joseph C. Mitchell for support of research on the reptiles and amphibians of Virginia book. This support will provide him and his coinvestigator, Chris Pague, the funds to cover visits to in-state and out-of-state museum and university collections so that verification of specimen identities can be made. In addition, locality, diet and reproductive information will be accumulated. Field research will be designed to fill geographic and information gaps identified during the museum phase of the project. The project will culminate in a reference book on Virginia herps.

The book will include keys to all species and individual species accounts. These accounts will include descriptions of color, pattern, body sizes and geographic variation of these characters, habitat, seasonal activity, diet, reproductive characteristics and known information on ecological interactions. Illustrations will include drawings, photos (possibly some in color), distribution maps and various graphs. All of the information will be based exclusively on Virginia specimens and little, if any, information will be gleaned from studies done outside the state.

The ultimate goal of this research is to summarize the natural history of Virginia's reptiles and amphibians so that the unknowns are truly identified. Accomplishing this is no easy task. Since everyone will benefit from the book, your cooperation is sought and any contributions in the form of information, specimens, field notes, etc. (published in CATESBEIANA, perhaps) are welcomed.

Questions and inquiries can be directed to Dr. Joseph C. Mitchell, Dept. of Biology, University of Richmond, Richmond, VA 23173, (804-285-6275).

Miscellaneous - While not in the advertising business, there are several items of interest to many VaHS members that should be brought to their attention. If you are interested in any of those listed below, you should write to the address provided:

Crickets: summer 1983 prices \$12.00 plus shipping per 1000 (he says  $\frac{1}{2}$  price for a get acquainted offer); write Linwood H. Scott, Director of Sales, P.O. Box 25658, Richmond, VA 23260-5658 (804-262-8902).

Color illustrations of western herps: excellent paintings of a variety of western herps by Dr. Robert C. Stebbins (Field Guide to Western Reptiles and Amphibians, Peterson Field Guide series), good prices; write Wildlife Impressions, P.O. Box 11440, Eugene, OR 97440.

## NEWS AND NOTES (CONTINUED)

Natural history prints by David M. Dennis, excellent prize-winning water color prints of herps; write Biographics, 12 Eagle's Head Road, Ithaca, NY 14850.

A review of diseases and treatments of captive reptiles, by James B. Murphy and Joseph T. Collins, \$16.00, AMS Publications, R.R. 2, Box 1, Lawrence KS 66044 (913-843-1199)

Proceedings of the reptile symposia on captive propagation and husbandry, volumes 1-6; Poisonous snakes of USA identification chart; Maintenance of rattlesnakes in captivity by Murphy and Armstrong; write Zoological Consortium, 13019 Catoctin Furnace Rd., Thurmont MD 21788

Turtles of Venezuela, by Peter C. H. Pritchard and P. Trebbau, late 1983; an SSAR publication; write Dr. Douglas H. Taylor, Dept. of Zoology, Miami University, Oxford, OH 45056.

Conserving sea turtles, by N. Mrosovsky, 1983, \$10.00 + 1.00 postage (use international money order); write Dr. S. Townson, British Herpetological Society, C/O Zoological Society of London, Regent's Park, London, NW1 4RY, England.

Natural History of Mexican Rattlesnakes, by Armstrong and Murphy, Special Publ., Museum of Natural History, University of Kansas, No. 5; and Maintenance of Rattlesnakes in Captivity by Murphy and Armstrong (noted above); write for information on these and other publications: Publications Secretary, Museum of Natural History, University of Kansas, Lawrence KS 66045.

Excellent carvings of reptiles and amphibians, by Ben Greishaw. Write 7622 Hollins Rd., Richmond, VA 23229 for a brochure or see him at the VaHS fall meeting.

VaHS needs news items. The editors of Catesbeiana want to be sure our membership is aware of events that may concern its members. Such things as entering school to work on a degree in biology, presentation of herp talks, media events, term projects or papers in herpetology, publication of papers, etc. Send us a list of your talks, with dates, and other information of interest. (The Editors)

Articles and notes needed. Publication of Catesbeiana cannot continue without your contributions. We know that many of you have observations of interest and/or enough information for an article. Write them down, send them to us and we'll work them into a publishable format. If you don't already, keep field notes: date, place, and herp observations. You could then send us the raw notes. It's as simple as that.

VaHS LIBRARY

The following is a list of the holdings of the VaHS library as of August 1983. All these materials are available for reading by any member on the campus of the University of Richmond; we do not yet have a check-out policy. Copies of the latest numbers will be made available for your perusal at VaHS meetings. An asterisk indicates those regional societies with which we exchange publications. These societies should check our holdings; completion of our sets would be appreciated.

- Arizona Herp. Assoc. Newsletter: 1978 8(10)  
Central Ohio Herp. Soc. Newsletter: 1979 1(4-6)  
(Greater) Cincinnati Herp. Soc. Newsletter: \*1980 3(2-4), 1980 4(5-8), 1982 7(11-12), 1983 8(1-4)  
Connecticut Herp. Soc. Bull: \* 1982 no. 9, newsletters 1982-1983  
Copeia (American Society of Ichthyologists & Herpetologists): 1930 (1,2), 1933 (4), 1934-1951 (1-4), 1952 (2-4), 1953-1958 (1-4)  
(Greater) Dayton Herp. Soc. Newsletter: \* 1982 1(1-12), 1983 1(1-6),  
El Paso Herp. Soc. Newsletter: 1973 1(2)  
Eastern Seaboard Herp. League Newsletter: \* misc. issues 1980-1982  
Florida Herpetologist: 1980 no. 1  
Gulf Coast Herp. Soc. Newsletter: 1973 1(5)  
Kansas Herp. Soc. Newsletter: 1975 no. 7, 1976 no. 12, 1980 no. 36,37, 1981, no. 43  
Kentucky Herp. Soc Newsletter: 1976 7(1,4-11)  
(Bulletin of the) Maryland Herp. Soc.: \* 1965 1(1), 1968 4(1-4), 1969 5(1-3), 1970-1972 vols. 6-8 (1-4 each), 1973 9(1), 1974 10(1-4), 1975 11(1,2,4,), 1976-1982 12-18(1-4), 1983 19(1)  
Massachusetts Herp. Soc. Review: 1973-1974 vols. 2-5  
Michigan Soc. of Herps. Newsletter: 1983 one unnumbered issue  
Minnesota Herp. Soc Newsletter: \* 1982 2(6-12), 1983 3(1-7)  
New Mexico Herp. Soc. Newsletter: \* 1970 7(1-5), 1971(8(1-4), 1972 9(1,3,4), 1973 10(1-5), 1974 11(1,2,5-10), 1975 12(1,3), 1976 13(1-3), 1977 14(1-4), 1978 15(1,3), 1979 16(3,4), 1980 17(2,3), 1981 18(1-6), 1982 19(1-4,6), 1983 20(1)  
New York Herp. Soc. Bull.: 1965 1(2-7) and 2(1-4), 1966 2(5-10) and 3(1), 1973 9(3-4)  
North Carolina Herp. Soc.: \* 1979 2(2-4), 1980-1982 vols. 3-5(1-4), 1983 6(1,2)  
North Texas Herp. Soc. Newsletter.: 1983 Feb., April  
Northern Ohio Assoc. of Herps (Notes from NOAH; no bulletins): \* 1976 3(4-7,9), 1976-1977 4(3-12), 1977-1982 vols. 5-9(1-12), 1983 10(1-6)  
Oklahoma Herp. Soc. Bull.: \* 1977 2(2,4), 1978 3(1-3), 1979 4(1-4), 1980 5(1-4) and spec. Supplement, 1981 6(2-4), 1982 7(1-4); Newsletters 1982 nos. 1-4, 1983 no. 1; Special Publications Nos. 1 and 2  
Palm Beach County Herp. Soc. Newsletter: 1979-1982 monthly issues  
(Bulletin of the) Philadelphia Herp. Soc.: \* 1958 6(2-6), 1959-1961 vols. 7-9 (1-6), 1962-1966 vols. 10-14(1-4), single annual issues 1967-1981 vols. 15-29; Newsletter 1964-1965 nos. 1-4, 1973 no. 7, 1974 nos. 8, 10  
(Greater) San Antonio Herp. Soc. Newsletter: 1981 1(4)  
San Diego Turtle & Tortoise Soc. Newsletter: 1980 9(1)  
St. Louis Herp. Soc. Newsletter: \* 1980 1(1-2), 1981 2(1-9), 1982 3(1-2,4-6,8-10), 1983 4(1); Journal: 1979 6(7-10), 1980 7(1-8); Special Issue no. 1  
T.E.A.M. (we cannot find what these initials pertain to - eds.): 1980 3(10)  
Turtle Trust: \* 1981 no. 4, 1982-1983 nos. 8-12; 1983 2(1) new series.

VaHS LIBRARY (continued)

Books:

Kuntz, R.E. 1963. Snakes of Taiwan. Quart. J. Taiwan Museum 16(1-2); reprinted by U.S. Naval Medical Research Unit No. 2

Addenda

The following items were noted in CATESBEIANA 3(1) and were donated by F.J. Tobey:

HISS News-Journal 1973 vol. 1

HISS Titles and Reviews 1973 1(1,2)

Herpetological Review 1968-1969 nos. 1-9, 1970-1981 vols. 2-12(1-4 each)

Journal of Herpetology 1968-1980 vols. 1-14(1-4 each)

Note: your donations are welcomed.

HUMOR

In our last issue (vol. 3, no 1) we printed part of a "piece of wit" that has been circulating about various institutions. The last half of this prose is reprinted below. We challenge you to add your intellectual ramblings to it.

"HERPETOLOGICAL MYTHS AND THE CARE AND FEEDING OF A HERPETOLOGIST

II. THE KEEPER AND THE KEPT

"HOW TO CAPTURE A HERPETOLOGIST." Be a good listener with a strong stomach or be the first member of the opposite sex seen by the herpetologist after returning from a long field trip.

"CARE AND FEEDING OF A HERPETOLOGIST." Herpetologists are astonishingly easy to care for. They should be kept warm, cuddled frequently, kept dry and provided with ultra-violet light. They can be persuaded to accept such diverse foods as potato chips, beef, and their own words. Under no circumstances should you offer them turtle soup or frog's legs; their digestive systems seem to reject these delicacies. Offer fresh water daily and provide them with beer and cheap wine ad libidum.

"DISEASES OF A HERPETOLOGIST." Herpetologists are much like many other mammals - wart hogs and the chimpanzee come to mind - and have much the same pathology. Do not become overly concerned if your herpetologist appears to be ill. However, if he lies without moving for more than two weeks, you'd better get yourself a another herpetologist. And, if small horns begin to appear supratemporally, apply the treatment suggested below.

"WHAT TO DO OF BITTEN BY A HERPETOLOGIST." If the herpetologist is of the same sex: bite back. If the herpetologist is of the opposite sex, biting may be interpreted with confidence as courtship behavior. The proper response is to gently bite back and stroke the herpetologist's thighs.

"DETERMINING THE SEX OF YOUR HERPETOLOGIST." Bite it and note the response using the criteria mentioned above."

## SSAR/HL SOCIETY MEETING ABSTRACTS

Several of our VaHS members and other herpetologists in Virginia presented papers at the 31st. annual meeting of the Herpetologist's League and 16th. annual meeting of the Society for the Study of Amphibians and Reptiles in August at the University of Utah. The abstracts are reprinted below so you can see what some of our professionals are doing.

Bader, R.N.

Brookneal, Va.

### DETERMINDING THE DISTRIBUTION AND THE STATUS OF THE PINE BARRENS TREE FROG HYLA andersoni IN NORTH CAROLINA

The North Carolina Herpetological Society(NCHS) was funded by the North Carolina Game Commission to determine the distribution and the status of Hyla andersoni within the state.

Several county records exist for H. andersoni but many are very old and they need to be updated. A committee was formed by NCHS members with their objective being to verify old county records as well as establishing as many new county records as possible within a two year period. At the end of this period recommendations would be made to the game commission as to the status of H. andersoni in North Carolina.

Brooks, G. R.

College of William and Mary, Williamsburg, Va. 23185

### MOVEMENT OF INDIVIDUALS WITHIN POPULATIONS OF ANOLIS LIVIDUS.

Two populations of Anolis lividus were studied from January to May and in August, 1980, on Montserrat, West Indies. All males over 60 mm in SLV except two and all adult females except one showed site fidelity. Nine of 45 males in population A moved a mean distance of 51m (range = 30 - 103m). Five of 68 males in population B moved a mean distance of 45m (range = 21 - 76m). Of the 14 that relocated, 12 had SVL's of less than 60mm. Only 3 females out of a combined 90 changed positions ( $\bar{x} = 22\text{ m}$ ). Young males maturing in an area that contains a resident adult male move until they locate a suitable site. There was no inter-populational exchange even though the two areas were relatively close (50 - 150m) and connected at one point by suitable habitat. The relation between inter- and intra-populational movements and the presence of a pattern step-cline will be discussed.

Brown, C. W. and C. H. Ernst

George Mason University, Fairfax, Virginia

### A STUDY OF VARIATION IN EASTERN TIMBER RATTLESNAKES, CROTALUS HORRIDUS.

Variation was examined in specimens of Crotalus horridus from the eastern United States in an attempt to substantiate the status of its two described subspecies as defined by Gloyd (1940). A particular effort was made to duplicate the results of a study by Pisani, et al. (1973), who concluded that no valid subspecies exist. A maximum likelihood factor analysis and stepwise discriminant analysis were performed on the same morphological characters used by Pisani, et al. (1973) in addition to several characters relating to adult size and pattern. Evidence presented here suggests that the two subspecies of C. horridus are valid in the eastern part of the range. Standard morphological characters alone are not sufficient in discriminating between the two forms. Rather, adult size and pattern differences, in conjunction with dorsal scale rows and number of ventral scales, best differentiate C. horridus into its two forms, C. h. horridus and C. h. atriceudatus.

Jenssen, T.A., and D.L. Marcellini  
VA Tech, Blacksburg, VA 24061; National Zoological Park, Washington, DC 20008  
COMPETITIVE INTERFERENCE BETWEEN THE PUERTO RICAN LIZARDS ANOLIS COOKI AND  
ANOLIS CRISTATELLUS (SQUAMATA: IGUANIDAE)

The habitat variables of cloacal temperature, perch height, perch diameter, and microhabitat were compared between the syntopic lizards, Anolis cooki and Anolis cristatellus. Within 5 km of each other, three study areas of similar habitat were established: one allopatric for A. cooki, one allopatric for A. cristatellus, and one sympatric area. No significant differences in the habitat variables were found between the sexes of a species or between species on the two allopatric areas, nor were there differences between sympatric and allopatric A. cristatellus. The two species shared the same climatic habitat and both tended to perch about 1 m above the ground in large bushes and trees. Sympatric A. cooki males and females, however, exhibited a significant divergence from their allopatric counterparts by utilizing much more simple microhabitat (standing dead vegetation and small bushes), a shift that may be in response to competitive interference from A. cristatellus. Behavioral data also indicate that A. cristatellus are dominant to A. cooki.

Lovich, J. E., C. H. Ernst, and S. W. Gotte  
Department of Biology, George Mason University, Fairfax, Virginia  
GEOGRAPHIC VARIATION IN CHINEMYS REEVESII AND THE STATUS OF GEOCLEMYS GRANGERI (SCHMIDT).

The Chinese coin turtle, Chinemys reevesii is widely distributed in eastern Asia from Korea to southern China. Within its range, three taxa have been described which are similar to C. reevesii except for minor differences (Geoclemys grangeri, Geoclemys paracaretta, and Damonia unicolor). Although these variants have been synonomized by some authors, no quantitative studies have been conducted to support or reject their validity. The present study examined 33 mensural and meristic characters of specimens throughout the range. Analysis indicates that all variants are within the diagnostic extremes observed in this species.

Savitzky, A. H.  
Old Dominion University  
VERTEBRAL PROTRUSION IN SNAKES: EVIDENCE FOR A NOVEL DEFENSIVE MECHANISM

Two genera of snakes have independently evolved high, thin neural spines, together with expanded accessory processes and shelflike extensions of the neural arches. Examination of preserved specimens reveals a high incidence both of protruding neural spines and of slitlike wounds in the middorsal skin. The hypothesis that vertebral protrusion represents a distinctive behavior, possibly associated with defense, is supported by derived attributes of scutellation, color pattern, and musculature in members of both genera. Behavioral observations are required in order to test this hypothesis.

Zug, G.R., A.S. Rand\*, A.H. Wynn, and B. Bock\*  
National Museum of Natural History, Washington, DC and \*Smithsonian Tropical  
Research Institute, Balboa, Panama.

SKELETOCHRONOLOGY OF PANAMANIAN IGUANA IGUANA: A TEST OF ANNUAL PERIOSTEAL  
GROWTH.

A long-term mark-and-recapture study of Iguana populations on Barro Colorado Island in the Panama Canal provided a data set to test the assumption of an annual periosteal growth cycle in a seasonal tropical environment. A phalanx was removed from each nesting female, both previously marked and unmarked individuals, and submitted through a blind test protocol for age estimation. The high congruence of the age estimates and the known age records supports the annual formation of a single periosteal annulus in a seasonal tropical environment. These positive results will permit the nondestructive investigations of unmarked populations of Iguana in order to determine growth rates, age and size at sexual maturity, and age structure of populations.

Zug, G.R., A.H. Wynn, and C. Ruckdeschel\*  
National Museum of Natural History, Washington, DC and \*Cumberland Island, GA.  
AGE DETERMINATION OF CARETTA CARETTA BY INCREMENTAL PERIOSTEAL GROWTH.

Periosteal growth in the skeletons of Caretta caretta is cyclic and produces a record of bony annuli. These annuli are most apparent in the long bones, particularly humerus and femur, of Caretta. Evidence supports the production of one annulus each year in other reptiles, and the annual nature of each bony annulus is an explicit assumption in our determination/estimation of age of Caretta from Cumberland Island, Georgia, USA. Age estimation is based on an extrapolation from existing periosteal annuli to total annuli produced during the life of the turtle. The estimates suggest that sexual maturity is obtained at 14-20 years from hatching. These data are congruent with age estimates derived from mark-and-capture growth data of other Southeast USA Caretta populations.

# Virginia Herpetological Society



The Virginia Herpetological Society was organized in 1958 to bring together people interested in advancing the knowledge of Virginia's amphibians and reptiles. The VaHS encourages the scientific study of Virginia's herpetofauna and its conservation. Educational activities continue to be important society functions.

Meetings are held twice each year, usually April and October. The program includes an exhibit session and a contributed papers session, during which members present information on their work on the amphibians and reptiles of Virginia.

The VaHS publishes a bulletin, CATESBEIANA, twice each year which contains articles, news and information on various aspects of Virginia herpetology. Members publish field notes and observations, distributional information and suggestions for improving husbandry techniques. Review articles appear occasionally. Material for inclusion should be sent to the editor, Dr. Joseph C. Mitchell, Dept. of Biology, University of Richmond, Richmond, VA 23173.

Society dues are currently \$5.00 per year for members over 18, \$3.00 for members under 18 and \$7.50 for families. Make checks payable to the Virginia Herpetological Society. Inquiries should be addressed to Dr. J. C. Mitchell, Dept. of Biology, University of Richmond, Richmond, VA 23173. Dues should be sent to the treasurer, Ben Greishaw, 7622 Hollins Rd., Richmond, VA 23229.

## MEMBERSHIP APPLICATION

I wish to initiate/renew (circle one) membership in the Virginia Herpetological Society for the year 19  .

Name \_\_\_\_\_

Address \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Phone \_\_\_\_\_

Dues Category \_\_\_\_\_